Space Weather Forecast

Issued on Tuesday 12 November 2024 at 12:16 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor./Moderate radio blackouts (R1/R2) likely throughout. Daily slight chance of Minor geomagnetic storms (G1) from midweek UTC.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity fell to Low over the past 24 hours, with occasional mid-ranking Common-class flares observed, these largely emanating from the largest and most complex sunspot region near the middle of the Sun, with the peak event at 11/1428UTC.

There are currently six sunspot regions on the facing side, with the aforementioned region dominating in terms of complexity. Most of the other regions formed a continuous train of spots in the southwest, with apparently simplifying trends.

There were four main 'filament'-related events (arcs of plasma) noted in the period - firstly a large partial filament eruption in the south-central disc, peaking around 11/1600UTC. This event has been analysed and determined to pass below the plane of the Earth's orbit to no effect at Earth. Secondly, a large 'prominence' eruption (arc of plasma on the Sun's edge) occurred on the northeastern solar horizon around 11/2100UTC. This too has been modelled and shown to be a miss (behind and above Earth's orbital track).

The two other events were an impulsive filament eruption in the far northwest at 11/2330UTC, and a slower emission in the far northeast at 12/0100UTC. These two final events have yet to be analysed but as a placeholder they appear largely directed off the Sun-Earth line in both cases.

Pending full analyses, no Earth-directed Coronal Mass Ejections (CMEs) were therefore in evidence.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of a slow regime. The solar wind speed fell from slightly elevated to background levels, the number of particles and their associated magnetic field were both unremarkable in being small-scale and stable. The net result of the above solar wind measures was for quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Isolated Moderate-class flares are likely, with a slight chance of Strong-class flares, most likely from the complex central sunspot. No major changes in sunspot region populations

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are expected in the period, and the risk trend is level.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast.

One main 'coronal hole' fast wind is due from day 2, Wednesday 13 November. There is then a daily slight chance of Minor geomagnetic storm G1 as a result, with the very start and very end of the four days perhaps most reliably quiet.

Energetic Particles / Solar Radiation: There is a rising slight chance of S1/Minor solar radiation storms, mainly due to any significant flares from the largest sunspot group as it rotates into a potentially more geoeffective position in the western solar hemisphere.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	20	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	70	70	70	70
Very Active	R3-R5 (X Class)	No	20	20	20	20

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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